

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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First Named Inventor : Toshihiro TAKAGI
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Docket No. : 010482.50895
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Title : Channel Selection Device for Use in Digital/analog
Broadcasting Receiver and Digital/analog Broadcasting
Receiver Equipped with The Same

APPEAL BRIEF

Mail Stop Appeal Brief- Patents

Commissioner for Patents
P.O. Box 1450
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Sir:

On November 27, 2007, Appellants appealed to the Board of Patent Appeals from the final rejection of claims 1-3 and 5-8. The following is Appellant's Appeal Brief submitted pursuant to 37 C.F.R. § 1.192.

I. REAL PARTY IN INTEREST

An assignment of the present application to Funai Electric Co., Ltd. was recorded on January 29, 2002 at Reel/Frame 012547/0648, which represents the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

Appellants are not aware of any appeals, interferences or other proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-3 and 5-8 are pending, rejected and the subject of this appeal. Claim 4 has been canceled and is not subject to this appeal.

IV. STATUS OF AMENDMENTS

Appellants have not submitted any amendments after the final Office Action dated July 27, 2007.

V. SUMMARY OF CLAIMED SUBJECT MATTER

1. Claim 1

Appellants' claim 1 is directed to a channel selection device used in a digital/analog broadcasting receiver 1. The channel selection device includes a receiver 2 for receiving an encoded digital/analog broadcasting signal originated from a broadcasting station, and a digital/analog decoder 3, 4 for decoding the digital/analog broadcasting signal received from the receiver and then outputting the signal to a display 12. The device also includes a memory 7 for storing, as a channel map, channel information contained in the broadcasting signal decoded

by the digital decoder, and a control unit 8 for controlling the sections of the receiver such that, upon reception of the channel selection instruction from the input device, the receiver 1 receives the broadcasting signal of a selected channel. The device further includes an input device 11 for inputting a user's instruction for channel selection to the control unit 8. The receiver 1 receives the digital broadcast and an analog broadcast which are originated through different physical channels, the digital broadcasting signal having, in one main channel, one or a plurality of sub-channels for originating contents therethrough and also having a VCT (Virtual Channel Table) containing virtual channel information providing the sub-channels with a correlation with an analog broadcasting physical channel.

When trying to select a channel based on a channel upward/downward changing instruction received from the input device 11 and when there is no channel information in the memory ("No" path out of decision step #1) a first technique is employed in which the frequency is shifted to search for a desired physical channel to thereby select a channel contained in a detected physical channel and also store information of the channel in the channel map (step #4).¹

When trying to select a channel based on a channel upward/downward changing instruction received from the input device and when there is channel information of a current physical channel in the memory ("Yes" path out of

¹ Figure 4 and page 16, lines 2-17.

decision step #1) a second technique is employed in which a VCT thereof is referenced to select a sub-channel in the physical channel (step #6).²

When trying to select a channel based on a channel upward/downward changing instruction received from the input device 11, when there is channel information for some physical channels in the memory (“No” path out of decision step #2) and when a channel to which the current channel is upward/downward changed by the second technique goes out of the current physical channel range (“Yes” path out of decision step #3) a third technique which is the first technique is employed (step #4).³

When trying to select a channel based on a channel upward/downward changing instruction received from the input device and when information of all the channels is stored in the channel map in the memory (“Yes” path out of decision step #2) a fourth technique is employed in which either a desired channel is selected by referring to the channel map or a desired channel is selected based on the physical channel information in the channel map among the channels over a plurality of physical channels and of employing the second technique of selecting a desired channel among the channels in the same physical channel (step #5).⁴

² Figure 4 and page 16, line 18-page 17, line 4.

³ Figure 4 and page 16, line 18-page 17, line 9.

⁴ Figure 4 and page 17, line 20-page 18, line 5.

2. Claim 2

Appellants' claim 2 is directed to a channel selection device used in a digital/analog broadcasting receiver 1. The channel selection device includes a receiver 2 for receiving an encoded digital/analog broadcasting signal originated from a broadcasting station, and a digital/analog 3, 4 decoder for decoding the digital/analog broadcasting signal received from the receiver and then outputting the signal to a display. The device also includes a memory 7 for storing, as a channel map, channel information contained in the broadcasting signal decoded by the digital decoder 3, and a control unit 8 for controlling the sections of the receiver such that, upon reception of the channel selection instruction from the input device 11, the receiver receives the broadcasting signal of a selected channel. The device further includes an input device 11 for inputting a user's instruction for channel selection to the control unit 8. The receiver receives the digital broadcast and an analog broadcast which are originated through different physical channels, the digital broadcasting signal having, in one main channel, one or a plurality of sub-channels for originating contents therethrough and also having a VCT (Virtual Channel Table) containing virtual channel information providing the sub-channels with a correlation with an analog broadcasting physical channel.

When trying to select a channel based on a channel upward/downward changing instruction received from the input device and when there is no channel information in the memory ("No" path out of decision step #1) a first

technique is employed in which the frequency is shifted to search for a desired physical channel to thereby select a channel contained in a detected physical channel and also store information of the channel in the channel map.⁵

When trying to select a channel based on a channel upward/downward changing instruction received from the input device 11 and when there is channel information of a current physical channel in the memory (“Yes” path out of decision step #1) a second technique is employed in which a VCT thereof is referenced to select a sub-channel in the physical channel (step #6).⁶

When trying to select a channel based on a channel upward/downward changing instruction received from the input device, when there is channel information for some physical channels in the memory (“No” path out of decision step #2) and when a channel to which the current channel is upward/downward changed by the second technique goes out of the current physical channel range (“Yes” path out of decision step #3) a third technique which is the first technique is employed (step #4).⁷

When trying to select a channel based on a channel upward/downward changing instruction received from the input device and when information of all the channels is stored in the memory (“Yes” path out of decision step #2) a fourth technique is employed in which a desired channel is selected on the basis of the physical channel information in the channel map among the channels over a

⁵ Figure 4 and page 16, lines 2-17.

⁶ Figure 4 and page 16, line 18-page 17, line 4.

plurality of physical channels and, it is selected by the second technique among the channels in the same physical channel (step #5).⁸

3. Claim 3

Appellants' claim 3 is directed to a channel selection device used in a digital/analog broadcasting receiver 1. The device includes a receiver 2 for receiving an encoded digital/analog broadcasting signal originated from a broadcasting station, and a digital/analog decoder 3, 4 for decoding the digital/analog broadcasting signal received from the receiver and then outputting the signal to a display. The device also includes a memory 7 for storing, as a channel map, channel information contained in the broadcasting signal decoded by the digital decoder, and a control unit 8 for controlling the sections of the receiver such that, upon reception of the channel selection instruction from the input device 11, the receiver receives the broadcasting signal of a selected channel. The device further includes an input device 11 for inputting a user's instruction for channel selection to the control unit 8. The receiver 1 receives the digital broadcast and an analog broadcast which are originated through different physical channels, the digital broadcasting signal having, in one main channel, one or a plurality of sub-channels for originating contents therethrough and also having a VCT (Virtual Channel Table) containing virtual channel information providing the sub-channels with a correlation with an analog broadcasting physical channel. The control unit 8, when trying to select a channel based on a

⁷ Figure 4 and page 16, line 18-page 17, line 9.

channel upward/downward changing instruction sent from the input device 11, appropriately uses any one of the following four techniques of:

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when there is no channel information in the memory ("No" path out of decision step #1) a first technique is employed in which the frequency is shifted to search for a desired physical channel to thereby select a channel contained in a detected physical channel and also store information of the channel in the channel map (step #4).⁹

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when there is channel information of a current physical channel in the memory ("No" path out of decision step #2) a second technique is employed in which a VCT thereof is referenced to select a sub-channel in the physical channel (step #6);¹⁰

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device, when there is channel information for some physical channels in the memory ("No" path out of decision step #2) and when a channel to which the current channel is upward/downward changed by the second technique goes out of the current

⁸ Figure 4 and page 17, line 20-page 18, line 5.

⁹ Figure 4 and page 16, lines 2-17.

¹⁰ Figure 4 and page 16, line 18-page 17, line 4.

physical channel range (“Yes” path out of decision step #3) a third technique which is the first technique is employed (step #4);¹¹ and

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when information of all the channels is stored in the memory (“Yes” path out of decision step #2) a fourth technique is employed in which a desired channel is selected by referring to the channel map (step #5).¹²

4. Claim 6

Appellants’ claim 6 is directed to a channel selection device used in a digital/analog broadcasting receiver 1. The channel selection device includes a receiver 2 for receiving an encoded digital/analog broadcasting signal originated from a broadcasting station, and a digital/analog decoder 3, 4 for decoding the digital/analog broadcasting signal received from the receiver and then outputting the signal to a display. The device also includes a memory 7 for storing, as a channel map, channel information contained in the broadcasting signal decoded by the digital decoder 3, and a control unit 8 for controlling the sections of the receiver such that, upon reception of the channel selection instruction from the input device 11, the receiver receives the broadcasting signal of a selected channel. The device further includes an input device 11 for inputting a user’s instruction for channel selection to the control unit 8. The receiver receives the

¹¹ Figure 4 and page 16, line 18-page 17, line 9.

¹² Figure 4 and page 17, line 20-page 18, line 5.

digital broadcast and an analog broadcast which are originated through different physical channels, the digital broadcasting signal having, in one physical channel (main channel), one or a plurality of sub-channels for originating contents therethrough and also having a VCT (Virtual Channel Table) containing virtual channel information providing the sub-channels with a correlation with an analog broadcasting physical channel.

When trying to select a channel based on a channel upward/downward changing instruction received from the input device and when the sub-channel is changed in the current main channel (“No” path out of decision step #11) a first procedure is employed in which the VCT in the current physical channel is referenced to select an upward/downward sub-channel (steps #16 and #17).¹³

When trying to select a channel based on a channel upward/downward changing instruction received from the input device 11 and when a main channel is to be changed (“Yes” path out of decision step #11) and if there is no channel data of a main channel to which the current main channel is to be changed and no channel data of the sub-channel (“No” path out of decision step #12) a second procedure is employed in which the reception frequency is shifted upward/downward to thereby search for other physical channels and then refers to the VCT of a detected physical channel, thus selecting a sub-channel having the largest/smallest sub-channel number (steps #18-20).¹⁴

¹³ Figure 6 and page 20, lines 3-6.

¹⁴ Figure 6 and page 20, lines 7-13.

When trying to select a channel based on a channel upward/downward changing instruction received from the input device and when a main channel is to be changed (“Yes” path out of decision step #11) and if there is the channel data of the main channel to which the current main channel is to be changed (“Yes” path out of decision step #12) and there is no sub-channel data (“No” path out of decision step #13) a third procedure is employed in which the main channel data is referenced to change the main channel (steps #21 and #22) and then refers to the VCT detected in the corresponding physical channel (step #19), thus selecting a sub-channel having the largest/smallest sub-channel number (step #20).¹⁵

When trying to select a channel based on a channel upward/downward changing instruction received from the input device and when a main channel is to be changed (“Yes” path out of decision step #11) and there is the channel data of a main channel to which the current main channel is to be changed and the sub-channel (“Yes” path out of decision steps #12 and #13) a fourth procedure is employed in which the channel data is referenced to change the main channel and the sub-channel, thus selecting the channel (steps #14 and #15).¹⁶

¹⁵ Figure 6 and page 20, lines 14-20.

¹⁶ Figure 6 and page 20, lines 21-25.

5. Claim 7

Appellants' claim 7 is directed to a channel selection device used in a digital/analog broadcasting receiver 1. The channel selection device includes a receiver 2 for receiving an encoded digital/analog broadcasting signal originated from a broadcasting station, and a digital/analog decoder 3, 4 for decoding the digital/analog broadcasting signal received from the receiver 2 and then outputting the signal to a display 12. The device also includes a memory 7 for storing, as a channel map, channel information contained in the broadcasting signal decoded by the digital decoder 3, and a control unit 8 for controlling the sections of the receiver such that, upon reception of the channel selection instruction from the input device 11, the receiver 2 receives the broadcasting signal of a selected channel, and an input device 11 for inputting a user's instruction for channel selection to the control unit 8. The receiver receives the digital broadcast and an analog broadcast which are originated through different physical channels, the digital broadcasting signal having, in one physical channel (main channel), one or a plurality of sub-channels for originating contents therethrough and also having a VCT (Virtual Channel Table) containing virtual channel information providing the sub-channels with a correlation with an analog broadcasting physical channel.

When trying to select a channel based on a channel upward/downward changing instruction received from the input device and when a sub-channel in the current main channel is to be changed ("No" path out of decision step #11)

the VCT contained in the current physical channel is referenced to change the sub-channel (steps #16 and #17).¹⁷

When trying to select a channel based on a channel upward/downward changing instruction received from the input device and when a main channel is to be changed (“Yes” path out of decision step #11) and there is no channel data of the main channel and the sub-channel (“No” path out of decision step #12) other physical channels to refer to a detected VCT are searched for, thus changing the sub-channel (steps #18-#20).¹⁸

When trying to select a channel based on a channel upward/downward changing instruction received from the input device and when there is the main channel data (“Yes” path out of decision step #12) but not the sub-channel data (“No” path out of decision step #13) the main channel data is referenced to change the main channel and referring to the corresponding VCT, thus changing the sub-channel (steps #21 and #22).¹⁹

When trying to select a channel based on a channel upward/downward changing instruction received from the input device and when there is the channel data of the main channel and the sub-channel (“Yes” path out of decision

¹⁷ Figure 6 and page 20, lines 3-6.

¹⁸ Figure 6 and page 20, lines 7-13.

¹⁹ Figure 6 and page 20, lines 14-20.

steps #12 and #13) the channel data is referenced to change each of the channels (steps #14 and #15).³⁰

VI. GROUNDS OF REJECTION TO BE REVIEW ON APPEAL

The one ground of rejection to be reviewed on appeal is whether claims 1-3 and 5-8 are obvious under 35 U.S.C. § 103(a) in view of the combination of U.S. Patent No. 5,982,411 to Eyer et al. (“Eyer”) and U.S. Patent No. 6,775,843 to McDermott (“McDermott”).

VII. ARGUMENT

1. The Combination of Eyer and McDermott Does Not Render Claims 1-3 and 5 Obvious

Appellants’ claim 1-3 and 5 recite four different channel selection techniques, and the selection of one of the four techniques depends upon satisfying one or more conditions. As will be described in more detail below, the combination of Eyer and McDermott does not disclose or suggest performing at least the first and third channel selection techniques based on the claimed conditions for performing such techniques. The following discussion focuses on the disclosure of McDermott because the rejection of claims 1-3 and 5 relies upon McDermott as disclosing the first and third channel selection techniques.

³⁰ Figure 6 and page 20, lines 21-25.

a. The Disclosure of McDermott

McDermott discloses a technique for digital television channel mapping in which an auto programming module 300 generates first and second mapping tables 185, and a mapping module uses these mapping tables.²¹ As illustrated in Figures 3A and 3B of McDermott, reproduced below, the auto programming technique tunes to each physical channel (steps 310 and 342) and obtains the virtual channel table (VCT) from each such channel.

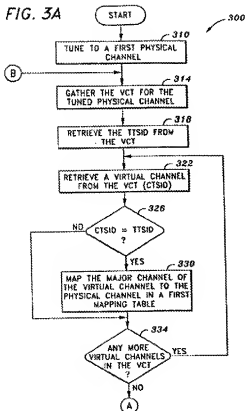
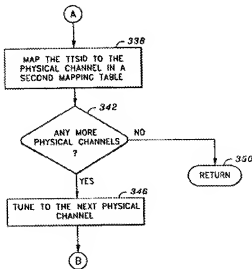
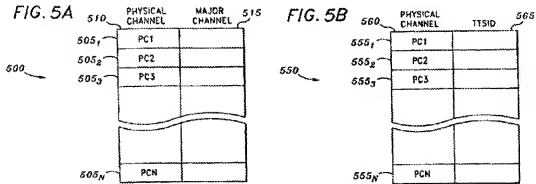


FIG. 3B



Information obtained from each VCT is used to generate the first and second mapping tables (steps 330 and 338). These mapping tables are stored in

a memory.²² As illustrated in Figures 5A and 5B, reproduced below, the first mapping table includes a physical channel number and corresponding major channel, while the second mapping table includes the physical channel number and the corresponding transport stream identifier (TTSID).

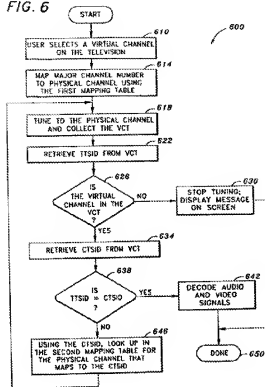


When a user selects a virtual channel, the method of Figure 6, reproduced below, is employed.

²¹ Col. 5, lines 1-3, and Figures 3A, 3B and 6.

²² Col. 4, lines 40-50.

FIG. 6

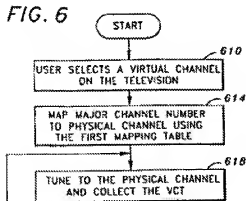


This method involves mapping a major channel number to a physical channel using the first mapping table (step 614). The physical channel is tuned to in order to collect the VCT (steps 618 and 622). When the virtual channel is not in the obtained VCT ("No" path out of decision step 626) then tuning is stopped (step 630). When the virtual channel is in the obtained VCT then, depending upon other conditions, the virtual channel is tuned to in order to decode audio and video signals (step 642) or the second mapping table is used to identify another physical channel (step 646).

b. **The Portion of McDermott Cited in the Rejection Does Not Disclose or Suggest the First and Third Channel Selection Techniques²³**

The rejection of claims 1-3 and 5 relies upon column 6, lines 21-31 of McDermott as disclosing the first and third channel selection techniques, as well as the conditions for selecting these techniques. One of the conditions for selecting the first or third channel selection technique is whether or not channel information is stored in a memory. Specifically, the first channel selection technique is performed “when there is no channel information in the memory”, whereas the third technique is performed “when there is channel information for some physical channels in the memory.”

Column 6, lines 21-31 of McDermott describes steps 600-618 of the method of Figure 6 (the portion of Figure 6 illustrating these steps is reproduced below).



McDermott does not, however, disclose or suggest a condition for performing steps 610-618 is whether or not there is channel information in the memory.

²³ Based on the Advisory Action it appears that the rejection is no longer based on Figures 3A-3B of McDermott.

Accordingly, the cited section of McDermott does not disclose or suggest the conditions used for determining whether to implement the first or third channel selection techniques.

c. **The Patent Office Has Not Developed a Sufficient Record to Determine How McDermott is Being Interpreted to Reject Claims 1-3 and 5**

As is well established, any rejection based on obviousness must consider each and every claim element. Therefore, in order to determine whether Appellants' claim 1 is obvious it is necessary to understand how McDermott is being interpreted in view of Appellants' claim language. Unfortunately, the record established by the Patent Office provides little guidance with respect to all of the claim language. For example, the rejection of Appellants' claims does not specify which element of McDermott corresponds to the claimed "channel information".²⁴ Based on the section of McDermott cited in the rejection, the only elements that could possibly be interpreted as including the claimed channel information is either the first mapping table or the VCT.²⁵

²⁴ Due to the ambiguity in the manner in which McDermott is being interpreted with respect to Appellants' claims 1-3 and 5, if this appeal is maintained, Appellants' respectfully request that the Examiner's Answer clarify how McDermott is being applied in order for the Board of Appeals to have a clear understanding of the rejection.

²⁵ This is not an admission that either of these elements could properly be interpreted as the claimed channel information, but instead Appellants are attempting to address any possible interpretation in order to provide a complete record for the Board of Appeals.

i. McDermott's First Mapping Table Does Not Disclose or Suggest the Claimed Channel Information

If the first mapping table, or the information contained therein, is being relied upon as corresponding to the claimed “channel information”, then the cited section of McDermott does not disclose or suggest one of the conditions for performing the first channel selection technique, i.e., “when there is no channel information in the memory”. Specifically, McDermott specifically discloses:

The FLASH ROM 155b contains mapping tables 185 and a mapping module 190, both of which are optionally copied into DRAM 155a during boot-up...Alternatively, the mapping tables 185 are contained in EEPROM 180.²⁶

Because McDermott specifically discloses that the first mapping table is contained in a memory, if the first mapping table is being relied upon as disclosing the claimed “channel information”, then McDermott does not disclose that the first channel selection technique is performed when the first mapping table is not contained in the memory.

ii. McDermott's VCT Does Not Disclose or Suggest the Claimed Channel Information

If, on the other hand, the VCT is being relied upon as disclosing the claimed “channel information”, then the cited portion of McDermott does not disclose or suggest the conditions for performing the third technique, namely that “there is channel information for some physical channels in the memory.” Referring again to the steps of Figure 6 of McDermott that are being relied upon in the rejection, the VCT is not present in memory when the user selects a

virtual channel on the television (step 610), but instead it is obtained in response to such a user selection (step 618). As such, the cited section of McDermott does not disclose or suggest that when trying to select a channel based on a channel changing instruction and there is a VCT in the memory, that “the frequency is shifted to search for a desired physical channel to thereby select a channel contained in a detected physical channel and also store information of the channel in the channel map.”

Furthermore, if the VCT is being relied upon as corresponding to the claimed “channel information”, then McDermott also does not disclose or suggest storing “information of the channel in the channel map.” Specifically, McDermott does not disclose that information obtained from the VCT in the channel selection technique of Figure 6 is stored in a channel map, and the cited sections of McDermott do not contain such a disclosure.

d. **The Arguments in the Advisory Action to Support the Rejection Finds No Support in McDermott**

The Advisory Action, without providing any citation to support this position, states the first three steps of method “would be performed when either of the conditions found in the claim were met.” The reason to support this position is that “these are the only two conditions that would exist in the system.” First, even if it is assumed that these are the only two conditions that could exist in the system, this does not necessarily mean that both of these

²⁶ Column 4, lines 42-48 (emphasis added).

conditions would exist prior to initiation of the method of Figure 6. As such, there is no support for the position that both of these conditions were met.

Moreover, it appears that the Advisory Action acknowledges that McDermott does not disclose or suggest both of the conditions of the first and third technique. Specifically, the Advisory Action states that because there would be channel information in memory, or there would not be, “one of the conditions would have to be met.” In order to render Appellants’ claims obvious, both of these conditions must be met. Therefore, merely meeting one of these conditions would not establish obviousness of Appellants’ claims.

e. McDermott Does Not Disclose or Suggest the Second Condition for Performing the Third Channel Selection Technique

The second condition for performing the third channel selection technique is “when a channel to which the current channel is...changed by the second technique goes out of the current physical channel range.” As discussed above, the rejection relies upon Eyer as disclosing the second channel selection technique. Accordingly, McDermott cannot disclose or suggest performing the third channel selection technique based on satisfying a condition that is not disclosed by McDermott, namely the channel selected by the second technique going out of range of the current physical channel.

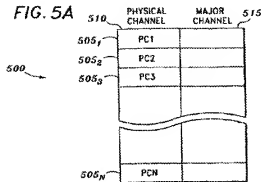
Furthermore, McDermott does not mention whether or not the method of Figure 6 is based on a channel going out of range of a current physical channel.

The Patent Office has not addressed where this condition can be found in the disclosure of McDermott.

2. The Combination of Eyer and McDermott Does Not Render Claims 6-8 Obvious

The combination of Eyer and McDermott does not render Appellants' claim 6 obvious because the combination does not disclose or suggest that a second procedure is employed when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when a main channel is to be changed and if there is no channel data of a main channel to which the current main channel is to be changed and no channel data of the sub-channel. The second procedure involves shifting the reception frequency upward/downward to thereby search for other physical channels and then refers to the VCT of a detected physical channel, thus selecting a sub-channel having the largest/smallest sub-channel number.

The Office Action cites column 6, lines 21-31 of McDermott to reject this claim element. As discussed above, this section discloses mapping a major channel number to a physical channel using the first mapping table that is stored in the memory of the receiver. As clearly illustrated in Figure 5A of McDermott (reproduced below) the first table includes the physical channel and corresponding major channel.



Therefore, this section of McDermott cannot disclose or suggest performing any procedures “if there is no channel data of a main channel to which the current channel is to be changed and no channel data of the sub-channel” as recited in Appellants’ claim 6 because McDermott clearly discloses that channel data is stored in the memory in the first and second mapping tables.

Eyer does not remedy this deficiency of McDermott. Accordingly, the combination of Eyer and McDermott cannot render claim 6 obvious. Claim 7 recites similar elements to those discussed above with regard to claim 6, and is patentably distinguishable for similar reasons. Claim 8 is patentably distinguishable at least by virtue of its dependency from claim 6.

Appellants’ note that these arguments for the patentability of claims 6-8 have been made in several responses, but the Patent Office has not yet specifically addressed the arguments presented for these claims. Appellants’ Reply filed on October 11, 2007, specifically requested that the Patent Office address Appellants’ arguments, but the Advisory Action included no such

information. Accordingly, in order to provide an adequate record for the Board of Appeals, Appellants respectfully request that the Examiner's Answer address these arguments.


VIII. CONCLUSION

For the foregoing reasons it is respectfully that the rejections of Appellants' claims 1-3 and 5-8 are improper, and therefore, these grounds of rejection should be reversed.

The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, to Deposit Account No. 05-1323, Docket No.: 010482.50895US.

Respectfully submitted,

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CLAIMS APPENDIX

1. A channel selection device used in a digital/analog broadcasting receiver comprising:

a receiver for receiving an encoded digital/analog broadcasting signal originated from a broadcasting station;

a digital/analog decoder for decoding the digital/analog broadcasting signal received from the receiver and then outputting the signal to a display;

a memory for storing, as a channel map, channel information contained in the broadcasting signal decoded by the digital decoder;

a control unit for controlling the sections of the receiver such that, upon reception of the channel selection instruction from the input device, the receiver receives the broadcasting signal of a selected channel; and

an input device for inputting a user's instruction for channel selection to the control unit,

wherein the receiver receives the digital broadcast and an analog broadcast which are originated through different physical channels, the digital broadcasting signal having, in one main channel, one or a plurality of sub-channels for originating contents therethrough and also having a VCT (Virtual Channel Table) containing virtual channel information providing the sub-channels with a correlation with an analog broadcasting physical channel,

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when there is no channel information in the memory a first technique is employed in which the frequency is shifted to search for a desired physical channel to thereby select a channel contained in a detected physical channel and also store information of the channel in the channel map;

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when there is channel information of a current physical channel in the memory a second technique is employed in which a VCT thereof is referenced to select a sub-channel in the physical channel;

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device, when there is channel information for some physical channels in the memory and when a channel to which the current channel is upward/downward changed by the second technique goes out of the current physical channel range a third technique which is the first technique is employed; and

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when information of all the channels is stored in the channel map in the memory a fourth technique is employed in which either

a desired channel is selected by referring to the channel map,
or

a desired channel is selected based on the physical channel information in the channel map among the channels over a plurality of physical channels and of employing the second technique of selecting a desired channel among the channels in the same physical channel.

2. A channel selection device used in a digital/analog broadcasting receiver comprising:

a receiver for receiving an encoded digital/analog broadcasting signal originated from a broadcasting station;

a digital/analog decoder for decoding the digital/analog broadcasting signal received from the receiver and then outputting the signal to a display;

a memory for storing, as a channel map, channel information contained in the broadcasting signal decoded by the digital decoder;

a control unit for controlling the sections of the receiver such that, upon reception of the channel selection instruction from the input device, the receiver receives the broadcasting signal of a selected channel; and

an input device for inputting a user's instruction for channel selection to the control unit,

wherein the receiver receives the digital broadcast and an analog broadcast which are originated through different physical channels, the digital broadcasting signal having, in one main channel, one or a plurality of sub-channels for originating contents therethrough and also having a VCT (Virtual Channel Table) containing virtual channel information providing the sub-channels with a correlation with an analog broadcasting physical channel.

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when there is no channel information in the memory a first technique is employed in which the frequency is shifted to search for a desired physical channel to thereby select a channel contained in a detected physical channel and also store information of the channel in the channel map;

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when there is channel information of a current physical channel in the memory a second technique is employed in which a VCT thereof is referenced to select a sub-channel in the physical channel;

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device, when there is channel information for some physical channels in the memory and when a channel to which the current channel is upward/downward changed

by the second technique goes out of the current physical channel range a third technique which is the first technique is employed; and

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when information of all the channels is stored in the memory a fourth technique is employed in which a desired channel is selected on the basis of the physical channel information in the channel map among the channels over a plurality of physical channels and, it is selected by the second technique among the channels in the same physical channel.

3. A channel selection device used in a digital/analog broadcasting receiver comprising:

a receiver for receiving an encoded digital/analog broadcasting signal originated from a broadcasting station;

a digital/analog decoder for decoding the digital/analog broadcasting signal received from the receiver and then outputting the signal to a display;

a memory for storing, as a channel map, channel information contained in the broadcasting signal decoded by the digital decoder;

a control unit for controlling the sections of the receiver such that, upon reception of the channel selection instruction from the input device, the receiver receives the broadcasting signal of a selected channel; and

an input device for inputting a user's instruction for channel selection to the control unit,

wherein the receiver receives the digital broadcast and an analog broadcast which are originated through different physical channels, the digital broadcasting signal having, in one main channel, one or a plurality of sub-channels for originating contents therethrough and also having a VCT (Virtual Channel Table) containing virtual channel information providing the sub-channels with a correlation with an analog broadcasting physical channel, wherein the control unit, when trying to select a channel based on a channel upward/downward changing instruction sent from the input device, appropriately uses any one of the following four techniques of:

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when there is no channel information in the memory a first technique is employed in which the frequency is shifted to search for a desired physical channel to thereby select a channel contained in a detected physical channel and also store information of the channel in the channel map;

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and

when there is channel information of a current physical channel in the memory a second technique is employed in which a VCT thereof is referenced to select a sub-channel in the physical channel;

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device, when there is channel information for some physical channels in the memory and when a channel to which the current channel is upward/downward changed by the second technique goes out of the current physical channel range a third technique which is the first technique is employed; and

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when information of all the channels is stored in the memory a fourth technique is employed in which a desired channel is selected by referring to the channel map.

4. (Canceled)

5. The digital/analog broadcasting receiver equipped with the channel selection device according to claim 1, for receiving a digital broadcast according to the ATSC (Advanced Television Systems Committee) standard

and an analog broadcast according to the NTSC (National Television Systems Committee) standard.

6. A channel selection device used in a digital/analog broadcasting receiver comprising:

a receiver for receiving an encoded digital/analog broadcasting signal originated from a broadcasting station;

a digital/analog decoder for decoding the digital/analog broadcasting signal received from the receiver and then outputting the signal to a display;

a memory for storing, as a channel map, channel information contained in the broadcasting signal decoded by the digital decoder;

a control unit for controlling the sections of the receiver such that, upon reception of the channel selection instruction from the input device, the receiver receives the broadcasting signal of a selected channel; and

an input device for inputting a user's instruction for channel selection to the control unit,

wherein the receiver receives the digital broadcast and an analog broadcast which are originated through different physical channels, the digital broadcasting signal having, in one physical channel (main channel), one or a plurality of sub-channels for originating contents therethrough and

also having a VCT (Virtual Channel Table) containing virtual channel information providing the sub-channels with a correlation with an analog broadcasting physical channel,

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when the sub-channel is changed in the current main channel a first procedure is employed in which the VCT in the current physical channel is referenced to select an upward/downward sub-channel;

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when a main channel is to be changed and if there is no channel data of a main channel to which the current main channel is to be changed and no channel data of the sub-channel a second procedure is employed in which the reception frequency is shifted upward/downward to thereby search for other physical channels and then refers to the VCT of a detected physical channel, thus selecting a sub-channel having the largest/smallest sub-channel number;

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when a main channel is to be changed and if there is the channel data of the main channel to which the current main channel is to be changed and there is no sub-channel data a third procedure is employed in which the main channel data is referenced to change the main channel and then refers to the VCT

detected in the corresponding physical channel, thus selecting a sub-channel having the largest/smallest sub-channel number; and

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when a main channel is to be changed and there is the channel data of a main channel to which the current main channel is to be changed and the sub-channel a fourth procedure is employed in which the channel data is referenced to change the main channel and the sub-channel, thus selecting the channel.

7. A channel selection device used in a digital/analog broadcasting receiver comprising:

a receiver for receiving an encoded digital/analog broadcasting signal originated from a broadcasting station;

a digital/analog decoder for decoding the digital/analog broadcasting signal received from the receiver and then outputting the signal to a display;

a memory for storing, as a channel map, channel information contained in the broadcasting signal decoded by the digital decoder;

a control unit for controlling the sections of the receiver such that, upon reception of the channel selection instruction from the input device, the receiver receives the broadcasting signal of a selected channel; and

an input device for inputting a user's instruction for channel selection to the control unit,

wherein the receiver receives the digital broadcast and an analog broadcast which are originated through different physical channels, the digital broadcasting signal having, in one physical channel (main channel), one or a plurality of sub-channels for originating contents therethrough and also having a VCT (Virtual Channel Table) containing virtual channel information providing the sub-channels with a correlation with an analog broadcasting physical channel,

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when a sub-channel in the current main channel is to be changed the VCT contained in the current physical channel is referenced to change the sub-channel;

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when a main channel is to be changed and there is no channel data of the main channel and the sub-channel other physical channels to refer to a detected VCT are searched for, thus changing the sub-channel;

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when there is the main channel data but not the sub-channel data the main channel data is referenced to change the main channel and referring to the corresponding VCT, thus changing the sub-channel; and

wherein when trying to select a channel based on a channel upward/downward changing instruction received from the input device and when there is the channel data of the main channel and the sub-channel the channel data is referenced to change each of the channels.

8. The digital/analog broadcasting receiver equipped with the channel selection device according to claim 6, for receiving a digital broadcast according to the ATSC (Advanced Television Systems Committee) standard and an analog broadcast according to the NTSC (National Television Systems Committee) standard.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None